DOCUMENT RESUME

ED 060 087 TM 001 245

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| TITLE | Teacher, Nursery School 359.878 -- Technical Report on Standardization of the General Aptitude Test Battery. Final Report. |
| INSTITUTION | Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service. |
| REPORT NO | USES-TR-S-47 |
| PUB DATE | Jan 54 |
| NOTE | 5p. |
| EDRS PRICE | MF-$0.65 HC-$3.29 |
| DESCRIPTORS | *Aptitude Tests; *Cutting Scores; Evaluation Criteria; Job Applicants; *Job Skills; Norms; Occupational Guidance; *Personnel Evaluation; *Preschool Teachers; Test Reliability; Test Validity |
| IDENTIFIERS | GATB; *General Aptitude Test Battery |

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 test s which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

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FINAL REPORT

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# TECHNICAL REPORT

# ON

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

# FOR

# TEACHER, NURSERY SCHOOL 359.878

S-47

U. S. Employment Service in
Cooperation with
Stephens College, Columbia, Missouri

TM 001 245

U. S. DEPARTMENT OF LABOR

Washington , D. C.
January 1954

GATB #551
June 1949

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR TEACHER, NURSERY SCHOOL 359.878

S-47

## Summary

The entire GATB, B-1001, was administered in May 1948 to a group of 36, and in May 1949 to a group of 47 female graduating students at Stephens College, Columbia, Missouri who received Certificates of Competence in Nursery School Work, a course of study designed to prepare students for the occupation of Teacher, Nursery School 359.878 The two groups were combined into a total sample of 83 students.

The criterion used was the total grade point average for each student's two years at Stephens College.

On the basis of high means, low standard deviations, correlations with the criterion, job duties and course descriptions, Aptitudes G-Intelligence and V-Verbal Aptitude were selected for inclusion in the test norms.

## GATB Norms for Teacher, Nursery School 359.878

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Teacher, Nursery School 359.878.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for S-47

| B-1001 | | | B-1002 | | |
|---|---|---|---|---|---|
| Aptitude | Tests | Minimum Acceptable Aptitude Score | Aptitude | Tests | Minimum Acceptable Aptitude Score |
| G | CB-1-H<br>CB-1-I<br>CB-1-J | 105 | G | Part 3<br>Part 4<br>Part 6 | 105 |
| V | CB-1-J | 105 | V | Part 4 | 105 |

## Effectiveness of Norms

The data in Table III indicate that 22 of the 42 poor students, or 53% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. Moreover, 30 of the 50 students who made qualifying test scores, or 60%, were good students.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Teacher, Nursery School 359.878

II. Sample

The entire GATB, B-1001, was administered in May 1948 to a group of 36, and in May 1949 to a group of 47 female graduating students at Stephens College, Columbia, Missouri, completing a two-year course of study in Nursery School Work, a curriculum designed to prepare students for the occupation of Teacher, Nursery School 359.878. The two groups were combined into a total sample of 83 students.

The age of the sample ranged from 16.8 to 21.5 years, with a mean of 18.3 years. Data for education and work experience are not included since the entire group consists of college students with no applicable work experience.

III. Course Description

Teacher, Nursery School 359.878

Students are given training to prepare them for working with small children, usually of prekindergarten age. The work involves activities such as planning and supervising play periods, teaching games and crafts, and reading or telling stories.

IV. Experimental Battery

All of the tests of the GATB, B-1001, were administered to 82 of the 83 students in the sample. The tests measuring Finger Dexterity (F) and Manual Dexterity (M) were not administered to one of the students.

V. Criterion

The criterion used is the total grade point average for each student's two years at Stephens College. Letter grades were assigned numerical scores as follows: A=4; B=3; C=2; D=1; F=0; Incomplete = 0. The criterion scores range from 1.55 to 3.66, and have a mean of 2.63 with a standard deviation of .41.

VI. Statistical and Qualitative Analysis

Means, standard deviations, and Pearson product-moment correlations with the criterion were calculated for the aptitude scores. The aptitudes which make up the final norms were selected on the basis of statistical data as well as on the basis of course content and job duties.

Table II shows the means, standard deviations, Pearson product-moment correlations with the criterion, and standard errors of correlation for the aptitudes of the GATB.

The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE II

Means (M), Standard Deviations ($\sigma$), Pearson Product-Moment Correlations With the Criterion (r), and Standard Errors of Correlation ($\sigma_r$) for the Aptitudes of the GATB

Teacher, Nursery School 359.878

N = 83*

| Aptitudes | M | $\sigma$ | r | $\sigma_r$ |
|---|---|---|---|---|
| G-Intelligence | 109.18 | 11.89 | .46 | .09 |
| V-Verbal Aptitude | 112.86 | 12.03 | .41 | .09 |
| N-Numerical Aptitude | 103.42 | 13.87 | .34 | .10 |
| S-Spatial Aptitude | 107.71 | 13.34 | .26 | .10 |
| P-Form Perception | 115.31 | 14.81 | .28 | .10 |
| Q-Clerical Perception | 110.96 | 15.46 | .20 | .11 |
| A-Aiming | 110.41 | 15.51 | .29 | .10 |
| T-Motor Speed | 109.43 | 16.46 | .33 | .10 |
| F-Finger Dexterity* | 115.00 | 17.00 | .24 | .10 |
| M-Manual Dexterity* | 89.50 | 19.11 | .27 | .10 |

*For Finger Dexterity and Manual Dexterity N = 82.

The statistical results were interpreted in conjunction with the information on course content and job duties. On the basis of course content and job duties, it appears that aptitude requirements for Teacher, Nursery School are as follows:

G-Intelligence - To acquire academic knowledge and to exercise judgment in planning and supervising activities for small children.

V-Verbal Ability - To read or tell stories to children and to pass on ideas clearly when teaching games and crafts.

Aptitudes G-Intelligence and V-Verbal Aptitude warrant consideration for inclusion in the test norms on the basis of statistical data as well as on the basis of course content and job duties. Aptitudes G and V show the highest correlations with the criterion, .46 and .41 respectively, which are both at the .01 level of significance. In addition, these two aptitudes have moderately high mean scores relative to the general population and also to the other mean aptitude scores for this sample. Aptitudes G and V also show the lowest standard deviations for this sample.

Other aptitudes which warranted consideration for inclusion in the test norms are Form Perception (P), Clerical Perception (Q), Aiming (A), Motor Speed (T), and Finger Dexterity (F). All have relatively high means and standard deviations lower than those of the general population; and, except for Aptitude Q, show significant correlation with the criterion. However, the correlations for these aptitudes, although significantly greater than zero, range from .24 to .33 and are substantially lower than the correlations of .46 and .41 obtained for Aptitudes G and V, respectively. In addition, these aptitudes appear to be relatively unimportant on the bases of course content and job duties.

On the basis of all factors considered—statistical data, course descriptions, and job duties—Aptitudes G and V were chosen for inclusion in the test norms. Computations were made to determine the predictive value of these aptitudes in different combinations with various cutting scores. A significant relationship was found between the criterion and Aptitudes G and V with a critical score of 105 for each of these two aptitudes. The critical score on each aptitude is set at one-half a standard deviation unit below the mean rounded to the nearest five-point score level. Because the norms involve only two aptitudes, better differentiation was effected at this point rather than at a full standard deviation unit below the mean.

For the purpose of computing a tetrachoric correlation coefficient and Chi Square value, the criterion was dichotomized so that students with grade point averages of 2.63 and above were placed in the high criterion group, and those with grade point averages below 2.63 were placed in the low criterion group.

Table III shows the relationship between the criterion and Aptitudes G and V each with a critical score of 105 for Teacher, Nursery School 0-30.02. Students in the high criterion group have been designated as "good students" and those in the low criterion group as "poor students."

TABLE III

Relationship Between Test Norms Consisting of Aptitudes G and V Each with a Critical Score of 105 and the Criterion for Teacher, Nursery School 359.878

N = 83

| | Non-Qualifying Test Scores | Qualifying Test Scores | Total |
|---|---|---|---|
| Good Students | 11 | 30 | 41 |
| Poor Students | 22 | 20 | 42 |
| Total | 33 | 50 | 83 |

$r_{tet} = .41$ $\quad X^2 = 4.64$

$\sigma_{r_{tet}} = .18$ $\quad P/2 < .025$

The data in Table III yield a tetrachoric correlation coefficient of .41 with a standard error of .18 and a Chi Square of 4.64 which yields a P/2 value of less than .025, indicating a significant relationship between the recommended norms and the criterion.

VII. Conclusions

On the basis of course analysis, job duties, mean scores, standard deviations, correlation coefficients, and their combined predictive efficiency, it is recommended that Aptitudes G and V, each with a minimum score of 105, be used as norms for Teacher, Nursery School 359.878.

The same norms are applicable to the Separate-Answer-Sheet Form of the GATB, B-1002.